Missoula Public Health
City-County Health Department

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April 2, 2018

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Keith Large
Montana Department of Environmental Quality
P.O. Box 2000901
Helena MT 59620

Re: Draft HHRA OU2 and OU3, BERA OU2 and OU3

Dear Sara and Keith,

The Missoula Valley Water Quality District appreciates the opportunity to comment on the above plans.

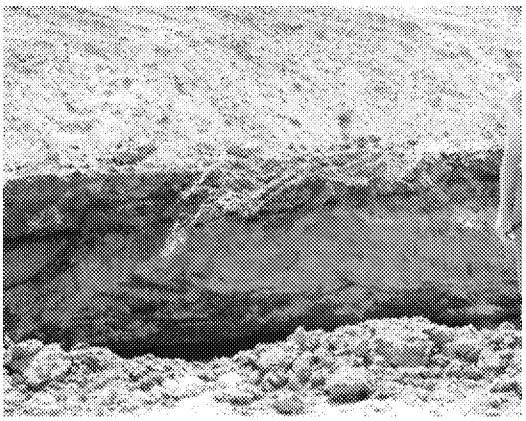
Our fundamental concern is the lack of adequate evaluation of sludge ponds and dumps. The density and depth of soil borings is not adequate to determine the types and volumes of materials present. Additionally, the Conceptual Site Models fail to address the risk of flooding or leaching of buried materials and their interaction with groundwater. While the top elevation of sludge ponds and dumps may be above base flood elevation, the base of these dumps may be below base flood elevation and in groundwater. There are many unanswered questions relating to the dumps and sludge ponds. Are leaking drums buried? What concentrations of PCBs, dioxins, metals, or other contaminants are in the dumps? What is the vertical and horizontal distribution of contaminants? Are these chemicals seasonally in contact with groundwater? If the non-engineered berms are breached and contaminants are released, what are risks to fish and humans from the resulting chemical exposures? We are also concerned that the methodology of filling data gaps in the risk assessments dilutes risks by compositing large numbers of samples over large areas (20 to 30-acre grids). We request that EPA suspend the risk assessment process and focus on first completing the remedial investigation.

In addition, the District has the following concerns:

Comments applicable to both HHRA OU2 and OU3

Section 2.1: Site Overview

- As pointed out in previous comments, the mill bleached approximately 30% of its product in early years of production (see photo). This needs to be corrected in the site overview. Most subsurface samples were collected from 24- 30 inches. Deeper samples are needed to characterize older layers deposited when bleaching was at its peak and substances like PCBs were in common use.


(Montana DEQ Solid Waste Program Files – 1992 Inspection – note layering of ash/sludge)

Section 3.1.2: Transport to the Environment

- This section should include transport via spills and leaks that were conveyed to the river and soils through ditches/conveyance structures.

Section 3.2.5 (OU3) & 3.2.3 (OU2): Exposure to Food Items

- The statement that "…most metals have little tendency to accumulate in plant tissue…" is not supported by recent research. The links below are just a sample of recent peer-reviewed journal research from our brief internet search indicating significant risk from consuming produce grown on heavy-metal contaminated soil. This pathway should be evaluated in the risk assessments.

  https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4808952/
  https://www.ncbi.nlm.nih.gov/pubmed/19068266

Section 3.3.4: Background Screen

The arsenic background concentration appears to be based on an anomalous arsenic result that should have been discarded. A duplicate sample(?) for SMW-1 collected 06/30/17 showed 53.5 µg/L total and 54.7 µg/L dissolved arsenic. Five other results from this well from 2015 through 2017 (including one taken a week after the elevated sample result) were consistently 1.1 to 1.2 ug/L. The sample is labeled "DUP", but no other result from that date at that well is listed. This sample may have been mislabeled or otherwise compromised. With the limited number of wells and samples used to establish background concentrations, this anomalous result significantly skews the background concentration, removing arsenic from the groundwater COPC list for OU2. This result clearly does not represent a background concentration and should not be used.

Section 3.4.3 Exposure Areas

- Exposure to groundwater contamination occurs on a well-to-well basis and not in homogeneous 20 to 100-acre grids. The Risk Assessments acknowledge that drinking water exposure evaluation *"is often performed on a well-by-well basis…because wells in different areas and screened at different depths may draw water with differing levels of contamination"*, and *"…there are insufficient numbers of samples (1 or 2) with data to support evaluation on an individual well basis"*; it then explains that because of this data gap, groundwater data was

grouped into "*exposure units*" and evaluated over very large areas. This underestimates potential exposure of individuals to a specific future well location. Groundwater should be evaluated on a well-to-well basis using more monitoring wells, and a sufficient number of samples per well to make appropriate and conservative exposure assumptions.

- Site-wide and OU-wide models may miss the risk of infrequent detections of chemicals that pose significant risk (for example one elevated result out of 25 samples). If the risk assessment requires a 5% detection frequency to justify further evaluation, the risk assessment fails to protect an individual who would be exposed to water from a contaminated well.

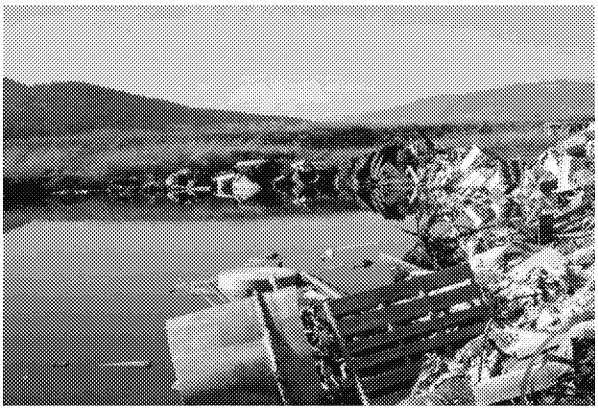
Section 6.0 and 6.1: Uncertainty

- We disagree with the statement that the omission of certain pathways is a "*small underestimation of exposure and risk*". For example, according to the EPA's preliminary site assessment (URS, 2011) (and as we mentioned in our April 29, 2016 comments), the dumps and sludge ponds in OU3 cover 160 acres and received an estimated 820,000 tons of sludge waste and over 5 million cubic yards of unknown waste during mill operations; the omission of pathways that consider this waste does not protect human health. These dumps were never licensed or closed according to State and Federal Law.
- There are several contaminants with method detection limits (MDL's) above risk-based concentrations (RBCs). The risk assessment states this is "… not a source of significant uncertainty." We disagree with this assertion. Analysis should be conducted at appropriate detection limits in order to properly evaluation risk. To do so otherwise is not conservative or protective of public health.
- The authors add the Hazard Quotient (HQ) values across different COPCs and assert that this provides a conservative estimate of hazards. The complex mixtures of unknown chemicals that are buried in the dumps could pose much higher risks and prevent the risk assessors from making informed site risk assessment conclusions. Potentiation (when a non-toxic chemical increases toxicity or bioavailability of another chemical) and synergistic risks of the site are not calculated. Though difficult to model, this means that the assessment should be truly conservative and thorough in its investigation of the site. Large grid-based sampling regimens do not accomplish this. Again, a complete understanding of the contents and volumes of the dumps and sludge ponds is essential.
- Groundwater depths in the mill area within OU2 are less than 20 feet below ground surface. Investigation of this site indicates a course cobble soil matrix below the High-Density Pulp Tank and Transformer areas. The most recent SCRIBE data shows contamination below above RBC's to remain in place. If this contamination has been removed, it is not reflected in the data. Further, given the porous nature of the soils and the fact that NFMW-2 has shown detectable levels of PCB's in groundwater, the District maintains that Leaching to Groundwater Screening Levels are more appropriate and protective in assessment of site risks.

HHRA OU3

Section 2.3: Solid Waste Basins

- The solid waste basins were documented to be in contact with groundwater. This is significant and should be thoroughly investigated prior to developing a risk assessment. Peak seasonal groundwater elevations should be determined, and sampling should be conducted during peak seasonal groundwater conditions.




(DEQ Solid Waste Management Program Files 1992 inspection)

Section 3.1.1: Primary Sources of Contamination

- This section fails to identify that landfills and storage ponds are a source of contamination to groundwater (see photos section 2.3 comments).
- Methane gas has been an issue at several of Missoula's cleanup sites including White Pine and Sash, Hart Refinery and The Missoula Sawmill. This risk to future residents and occupants of the site has not been evaluated. The 2014 site investigation driller logs and field notes document multiple instances of sulphur odors and methane, which were confirmed by photo-ionization detectors. These are considered landfill gasses and must be evaluated as part of landfill closure.

Section 3.1.2: Transport in the Environment

- Another bullet is needed to mention the route of saturation and leaching of subsurface materials in sludge ponds and landfills as well as the potential of catastrophic release during a flood. The bottom elevation of some of the sludge ponds and landfills are likely at or below base flood elevation.

Section 3.1.3: Hypothetical Future Land use

- Hypothetical future land use in the HHRA erroneously omits development in the floodplain and only includes upland areas of OU3. Development is allowed in the floodplain provided certain analysis occurs demonstrating no net rise of floodwaters and that first floors be constructed 2 feet above base flood elevations. Wells are also permitted in floodplains under State and County regulations if the well head is 2 feet above base flood elevation.

Section 3.2.2: Exposures to Groundwater

- Exposures to groundwater in the OU3 floodplain need to be addressed; wells are permitted in the floodplain with appropriate permitting from the Missoula County Floodplain Administrator.

Section 3.3.1: COPC Selection

- The COPC selection process specifies that when a chemical is detected in fewer than 5% of the site samples and it is detected above the RBC, it is identified as a source of uncertainty. Detection of a chemical above screening levels indicates an elevated localized concentration and that its source and extent of contamination should be further evaluated.

Section 3.3.5: COPC Screening Results (Table 3-8)

- The maximum total cadmium (Cd) level listed for groundwater is not correct. A concentration of 6.1 µg/L was detected in SMW-15 on 7/10/17, exceeding the state and federal drinking water standard, 2.5 µg/L on 12/15/2017 and 1.6 µg/L on 4/16/14. The table indicates that the maximum level detected is less than the RBC of 0.92 µg/L; that is not correct. Cadmium in groundwater should be evaluated as a COPC.
- Pentachlorophenol was detected at a level of 11.1 µg/L in NFMW9 in 2015 but is screened out as COPC based on not being present in >5% of samples. Detection limits from all samples are all well above the RBC (0.041 µg/L) and MCL (1 µg/L) so there is no way to know if it is present in more than 5% of the samples. This should be tagged as source of uncertainty; resampling with a lower detection limit is needed to rule this out as a COPC.
- Aroclor 1260 COPC groundwater assessment indicates that this contaminant is found in >/= 5% of samples, but that site concentrations are not greater than background; Table 3-3. Background Groundwater Summary Statistics indicate that the background concentration is 0.015 µg/L (looks like ½ of MDL is used because there were no detections). The maximum detected on site is listed as 0.31 µg/L, which is above the RBC of 0.0078 µg/L. Also, the average MDL is much higher than the RBC, and this is not noted as a source of uncertainty. We have not seen congener data for groundwater. We understood this was to be collected in December, 2017.

Section 3.3.2: Fish Consumption Rates

- The consumption rates of 43 g/day do not account for tribal subsistence consumption rates. Harris and Harper (https://ir.library.oregonstate.edu/downloads/8p58pj95k) found rates of 540 g/day in the Confederated Tribes of the Umatilla Indian Reservation which is physically closer to this site than the tribal consumption rates from North Dakota sited in the HHRA.

Section 3.3.4: Background Screen

- Background analysis for PCBs were performed on PCBs as Aroclors. We believe that all analysis (background and offsite) for PCBs related to this site should be conducted as congeners.
- Background data for dioxin and PCB concentrations in fish is lacking as identified by EPA. We concur that use of out-of-state data from a lake environment is not appropriate. The District urges EPA to conduct a more thorough fish study to include species such as Mountain Whitefish and to incorporate a larger geographic area.

Section 3.3.5: COPC Screens for Sediment and Surface Water

- Second paragraph states *"To the extent that additional surface water and sediment data are collected from these water bodies during future sampling events that are relevant to refining this assessment, an addendum to the HHRA will be developed to evaluate those additional data".*

This statement is vague. EPA should order more sampling to be done to eliminate uncertainties. More sediment, surface water and fish tissue data is needed. This should be done before completing the risk assessment.

Section 3.4.3: Exposure Areas, Floodplain

- This should be revised to include residential use. Residential development is allowed in the floodplain provided certain conditions are met (elevation and hydraulic evaluation).

Section 3.4.4: Exposure Point Concentrations, Soil

- We are very concerned with the compositing approach. The grid sizes are too large (20,30,100 acres). This makes it very likely that elevated samples get diluted. Further, exposure units of this size are not typically how a resident would be exposed to soil. Typical yards are not 20 acres in which a person is equally exposed. In addition, more discrete/biased sampling is needed in conveyances and low-lying areas to assess risk. Interim removal of pcb-contaminated materials at TSB and HDPT skew over-all EU risks evaluation that could otherwise trigger more in-depth analysis of the area.

Section 3.4.6: Cooking Loss in Fish Tissue

- Cooking to reduce PCBs is questionable. We were unable to find the data in the referenced study that is transferred to the risk assessment. The study stated that the only method that significantly reduced concentrations was preparing the fish by removing skin, fins and lateral line and deep frying. This is too specific and not representative of the most common cooking methods. This questionable assumption should not be used in a quantitative risk evaluation.

Section 5.2: Risks from Exposures to COPCs in OU3 Groundwater Wells

- Again, cadmium should have been retained as a COPC and exposures should have been evaluated. Levels above the RBC and MCL were detected at SMW 15.

HHRA OU2

Section 2.3: Data Overview

- The PCB removal effort in OU2 per Addendum 5 of the RIWP effectively lowered overall grid-based sampling concentration of that EU. By replacing contaminated samples with lower concentration samples, the over-all risk of the site (and other hot spots that may have been missed) is understated.
- There were samples elevated above the screening levels for PCBs in December 2017 results; was additional removal carried out until confirmation samples were clean?
- The High-Density Pulp Tank Foundation is just one of many locations in which PCB oil was used historically in electrical or hydraulic equipment in OU2. There are seven additional tanks in the immediate area of the high-density pulp tanks. It is logical that if PCB-containing caulks, sealants and paints were used around the contaminated tank foundation which was removed, there may be similar contamination surrounding other tanks and containment basins. Target sampling should occur in these areas.

- Grid 8 and Grid 1 surface soil composite samples exceeded screening levels for Aroclor-1254. This indicates that there are source areas within these grids. Rather than assume equal exposure over the entire 20-acre grid for a future resident, additional sampling should take place to identify hotspots within that grid, and those source areas should be removed.
- Many grids had high levels of PCB-congeners in OU2 (Grids 6, 8, 11, 13, and 15). However, Appendix D lists the calculated HQ to be below 1.0. Data for each grid was determined using composite sampling over 20 acres (or 100 acres in OU3). Again, this assessment method underestimates risk and results in an inaccurate HQ.

Section 3.1.1: Primary Sources of Contamination

- Conveyances and low-lying areas should all be sampled for COPCs.

Section 3.4.3: Land Use

- Grid based sampling is appropriate if done at a reasonable scale with an adequate number of samples; 20 and 100-acre exposure units are not reasonable and will dilute hot samples. Further, this is not the scale at which people are exposed to soils. If composite sampling is conducted, it should be in smaller grids. The same can be said for groundwater. Groundwater is not consumed in exposure units. Groundwater should be evaluated on a well-to-well basis.

BERA Workplan

Section 4.1: COPEC Refinement

- The District concurs that that background fish data is a weakness of the risk assessment. We believe this data should be evaluated in fish species in addition to the macroinvertebrates, sediments and soils and not as a tiered approach. The nature of PCBs, dioxins and mercury in the ecosystem is bio-accumulative and sediments may have scoured over time and may be easier to miss. A wider geographic study of COPCS in fish tissue is warranted.

Section 4.2: Refined CSM

- The model does not address the risk of berm failure and erosion of materials on the downstream aquatic system.

Section 5.1.5: Food Web Exposure

- We are concerned that the tiered approach could miss impacts to the higher-level food web. If sediments have been scoured or diluted to levels that would not trigger additional testing in higher trophic levels, the exposures to aquatic and human life from bioaccumulated contaminants in higher-level predator fish would not be evaluated.

Section 6.1.1.1: Existing Surface Soil Data for OU2

- More targeted sampling needs to be done in logical source areas including low lying areas around hydraulic equipment such as cranes and in other tank areas where caulk, paint and sealants containing PCBs may have been used. This should include ditches and conveyances that transported spills.

Section 6.1.2: Subsurface Soil

- As stated above, dumps and ponds need to be adequately characterized. The CSM for ecological exposure should include erosion and transport downstream of subsurface materials during a major flood.

Section 6.1.3.3: Sediment and Surface Water Data Gaps

- We agree that there is a data gap regarding testing of onsite ponds and conveyances. With regards to PCB's, this analysis should include congeners.

In summary, we believe the data collected to date is insufficient and does not adequately identify and characterize the risks at the site. The glaring omission is the failure to fully characterize sludge and landfill areas and to consider the impacts of a large flood. Further, the grid-based sampling approach unreasonably dilutes data and makes assumptions of exposure that do not represent reality. We request EPA suspend the risk assessment process until a complete remedial investigation is completed.

Thank you for the opportunity to comment.

Sincerely,

Travis Ross
Missoula Valley Water Quality District

cc: Joe Vranka, Superfund Branch Chief EPA, Region 8
Tom Livers, Director, Montana Department of Environmental Quality